

Remarks

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 1-39 are pending in the application, with claims 1, 11, 22, 33 and 37 being the independent claims. No claims are sought to be cancelled. No new claims are sought to be added.

Based on the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding rejections and that they be withdrawn. Applicants believe that the claims previously presented in the last Amendment and Reply filed March 26, 2008, which are once again presented herein, should be entered after final because the last amendment places the application in condition for allowance.

Rejections under 35 U.S.C. § 112, First Paragraph

The Examiner has rejected claims 1-39 under 35 U.S.C. § 112, first paragraph, for allegedly failing to comply with the enablement requirement. Applicants respectfully traverse this rejection.

The Examiner asserts that “[t]he claim(s) contains (*sic*) subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.” *Office Action at p. 2.* The Examiner continues by asserting “that applicant has claimed a system with both a hybrid and speaker microphone coupled to the same driving point (as shown in applicant’s figure 7).” *Id.* The Examiner further contends “that this is not an obvious or well known configuration and examiner contends one skilled in the art would not know how to implement such an interface

based on applicant's disclosure." *Id.* Finally, the Examiner notes "that applicant has stated that the electrical echo in the claims is not referring to any parasitic coupling at the interface, as such the examiner contends there is no other well known implementation of applicant's Fig. 7." *Id.*

Applicants respectfully submit that the claims are supported by the disclosure, and that the specification describes how to make and use the invention. As stated in the Manual of Patent Examining Procedure (M.P.E.P.) at § 2164.01, "the test for enablement is whether one reasonably skilled in the art could make or use the invention from the disclosures in the patent coupled with information known in the art without undue experimentation." (*quoting U.S. v. Telectronics, Inc.*, 857 F.2d 778, 785 (Fed. Cir. 1988). *M.P.E.P.* § 2164.01.

Independent claim 1 is representative of the claim set 1-39, and recites the following:

An echo canceller comprising:

a combiner for combining a secondary audio signal and a far end primary telephony signal into a single combined reference signal, wherein the secondary audio signal comprises secondary near end acoustic and electrical signals; and

an adaptive filter coupled to the combiner for receiving the single combined reference signal as input, the adaptive filter having filter coefficients adapted to cancel a combination of an electrical and an acoustical echo in a near end signal by modeling in parallel the electrical echo, caused by imperfect impedance matching of network transmission sections, comprising at least a portion of the primary telephony signal and the acoustical echo comprising at least a portion of the secondary audio signal.

The specification describes how to make and use the claimed invention in numerous places, including the following.

With reference to the first feature of claim 1, namely: "a combiner for combining a secondary audio signal and a far end primary telephony signal into a single combined reference signal, wherein the secondary audio signal comprises secondary near end acoustic and electrical signals," the specification notes the following:

"In the described exemplary echo cancellation system, combiner 301 combines a downsampled secondary audio signal 340(a) and far end reference signal 300 into a single 8 kHz combined reference signal 301(a)." *See specification at page 14, lns. 14-17 and FIG. 7.*

Similarly, with reference to the second feature of claim 1, namely: "an adaptive filter coupled to the combiner for receiving the single combined reference signal as input, the adaptive filter having filter coefficients adapted to cancel a combination of an electrical and an acoustical echo in a near end signal by modeling in parallel the electrical echo, caused by imperfect impedance matching of network transmission sections, comprising at least a portion of the primary telephony signal and the acoustical echo comprising at least a portion of the secondary audio signal," the specification notes the following:

"The combined reference signal 301(a) may then be input into a single 8 kHz adaptive filter 200 ..." and "The described exemplary adaptive filter 200 models the impulse response of the acoustic echo path, such

as for example, between the loudspeaker 329 and microphone 330 in parallel with the impulse response between the transmit channel and the receive channel of the network interface." *See specification at page 14, lns. 17-18, 23-27 and FIG. 7.*

"Referring to FIG. 8, in the described exemplary embodiment, the adaptive filter models in parallel the transfer functions of each of the three possible echo paths. Specifically, the adaptive filter models the transfer function 400 of the electrical echo path resulting from reflections of the far end voice created by the impedance mismatch at the two-four wire conversion in the hybrid. The adaptive filter also models the transfer function of the acoustic echo path 402 between the secondary audio signal being broadcast by speaker 328 and the microphone 330 as well as the transfer function of the acoustic echo path 404 between the speaker 329 broadcasting the far end voice signal and the microphone 330." *See specification at page 15, lns. 28-35, page 16, lns. 1-4 and FIG. 8.*

The specification provides further information on how to make and use the adaptive filter at various other places. *See, e.g., Specification at page 14, lns. 30-35, page 19, lns. 25-31.*

As noted earlier, the Examiner asserts that FIG. 7 shows "a hybrid and speaker microphone coupled to the same driving point." *Office Action at p. 2.* However, FIG. 7 illustrates a simplified schematic diagram of an exemplary stereo echo cancellation system that provides acoustic and electric echo cancellation. While the telephone remains physically connected to the hybrid in the same manner as shown in FIG. 5, FIG. 7 highlights the three echoes of interest, namely an acoustical echo from music/audio signal, an acoustical echo from the phone loudspeaker, and the electrical

echo from the hybrid. FIG. 7 depicts the two acoustic echoes emerging from the microphone as an electric signal that merges with the electrical echo from the imperfections of the hybrid. FIG. 8 continues the illustration by showing the transfer function for each of these echoes, with the echo canceller designed to “invert” or “cancel” these echoes. Conceptually, these three echoes sum together as shown in FIGs. 7 and 8.

Specifically in FIG. 7, incoming connections to the microphone 330 are acoustic signals, rather than electrical signals. Further in FIG. 7, the “hybrid” is labeled “Hybrid H” and is not the “Hybrid” that is labeled with Ref. Des. 166, as shown in FIG. 5. Finally, the summation point in FIG. 7 is not shown with a Ref. Des. Number, thereby reinforcing the fact that the simplified schematic of FIG. 7 depicts an abstraction that highlights the three echoes of interest and the cancellation scheme.

Based on the above analysis, Applicants therefore respectfully request that the rejection to claim 1 be withdrawn.

With respect to the remaining claims 2-39, claim 1 is representative of the features claimed. In the absence of specific rejections in the Office Action for each of the claims 2-39, Applicants believe that the above analysis addresses the remaining claims 2-39. Accordingly, Applicants therefore respectfully request that the rejections to claims 2-39 be reconsidered and withdrawn.

Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

A handwritten signature in black ink, appearing to read "Michael D. Specht", written in a cursive style.

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